DON BOSCO ARTS & SCIENCE COLLEGE

ANGADIKADAVU

(Affiliated to Kannur University Approved by Government of Kerala)

ANGADIKADAVU P.O., IRITTY, KANNUR – 670706

COURSE PLAN

MSc MATHEMATICS

(2019 – 2021)

SEMESTER - II

ACADEMIC YEAR - (2019-20)

II Semester MSc Mathematics (2019 - 21)			
SL. No.	Name of Subjects with Code	Name of the Teacher	Duty Hours per week
1.	MAT2C06 Advanced Abstract Algebra	Prija V.	5
2.	MAT2C07 Measure and Integration	Noble Philip	5
3.	MAT2C08 Advanced Topology	Najumunnisa K	5
4.	MAT2C09 Foundations of Complex Analysis	Riya Baby	5
5.	MAT2C10 Partial Differential Equations & Integral equations	Sebin Abraham	5
	Name of Class Incharge	Prija V.	

TIME TABLE

Day	09.50 Am - 10.45 Am	10.45 Am - 11.40 Am	11.55 Am - 12.50 Pm	01.40 Pm - 02.35 Pm	02.35 Pm - 03.30 Pm	3.35 Pm- 04.30 Pm
1	MAT2C10 Partial Differential Equations & Integral equations	MAT2C08 Advanced Topology	MAT2C07 Measure and Integration	MAT2C06 Advanced Abstract Algebra	MAT2C09 Foundations of Complex Analysis	MAT2C10 Partial Differential Equations & Integral equations
2	MAT2C07 Measure and Integration	MAT2C06 Advanced Abstract Algebra	MAT2C08 Advanced Topology	MAT2C09 Foundations of Complex Analysis	MAT2C10 Partial Differential Equations & Integral equations	MAT2C07 Measure and Integration
3	MAT2C09 Foundations of Complex Analysis	MAT2C06 Advanced Abstract Algebra	MAT2C10 Partial Differential Equations & Integral equations	MAT2C08 Advanced Topology	MAT2C07 Measure and Integration	MAT2C09 Foundations of Complex Analysis
4	MAT2C08 Advanced Topology	MAT2C09 Foundations of Complex Analysis	MAT2C07 Measure and Integration	MAT2C10 Partial Differential Equations & Integral equations	MAT2C06 Advanced Abstract Algebra	MAT2C08 Advanced Topology
5	MAT2C06 Advanced Abstract Algebra		MAT2C09 Foundations of Complex Analysis	MAT2C08 Advanced Topology	MAT2C07 Measure and Integration	MAT2C06 Advanced Abstract Algebra

Subject Code:	**MAT2C06**
Subject Name:	**Advanced Abstract Algebra**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Prija V.**

Module –I:

Unique Factorization Domains, Euclidean Domains, Gaussian Integers and Multiplicative Norms, Introduction to Extension Fields (Chapter-9: Section - 45, 46, 47 and Chapter-6: Section - 29).

Module – II:

Algebraic Extensions, Geometric Constructions, Finite Fields, Automorphisms of Fields. (Chapter-6: Section - 31, 32, 33 and Chapter-10 : Section- 48).

Module – III:

The Isomorphism Extension Theorem, Splitting Fields, Separable Extensions. Galois Theory (Chapter-10: Section – 49, 50, 51, 53).

Prescribed Textbook

John. B. Fraleigh, A First Course in Abstract Algebra (7th Edition), Narosa (2003)

Books for Reference

1. I. N. Herstein: Topics in Algebra. Wiley India Pvt. Ltd, 2006
2. D. S. Malik, John. N. Merdson, M. K. Sen: Fundamentals of Abstract Algebra Mc Graw-hill Publishing Co., 1996
3. Clark, Allen: Elements of Abstract Algebra. Dover Publications, 1984
4. David M. Burton: A First course in Rings and Ideals. Addison-Wesley Educational Publishers Inc., 1970
5. Joseph. A. Gallian: Contemporary Abstract Algebra. Narosa, 1999 M. Artin: Algebra Addison Wesley; 2nd edition, 2010

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	04-11-2019 To 08-11-2019	1	Introduction.
		2	Unique Factorization Domains, Euclidean Domains.
		3	Ascending chain condition for a PID.
		4	Theorems on PID.
		5	Euclidean algorithm and examples.
		6	Class test.
2	11-11-2019 To 15-11-2019	7	Euclidean domains and examples.
		8	Theorem.
		9	Theorem.
		10	Gauss's lemma.
		11	Assignment .
		12	Class test.
3	18-11-2019 To 23-11-2019	13	Problems based on Euclidean algorithm.
		19 Nov	Union Inauguration
		14	Gaussian integers and examples.
		15	Gaussian Integers and Multiplicative Norms.
		16	Theorem.
		23 Nov	Sports Day
4	25-11-2019 To 29-11-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
5	01-12-2019 To 05-12-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break

No of Weeks	Dates	Session	Topic
6	09-12-2019 To 13-12-2019	17	Class test.
		18	Introduction to extension field.
		19	Definitions and examples.
		20	Kronecker's lemma
		21	Theorem.
		22	Theorem.
		12 Dec	Arts Day
		13 Dec	Arts Day
7	16-12-2019 To 20-12-2019	23	Algebraic numbers.
		24	Transcendental numbers.
		25	Examples and problems.
		26	Class test.
		27	Revision- first module.
		20 Dec	Christmas Celebration
8	23-12-2019 To 28-12-2019		Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
9	30-12-2019 To 03-01-2020	28	Module 2- introduction
		29	Algebraic Extensions, Finite Fields, Automorphisms of Fields.
		30	Theorem.
		02 Jan	Mannam Jayanthi – Holiday
		31	Theorem.
10	06-01-2020 To 10-01-2020	06 Jan	First Internal II Semester PG
			First Internal II Semester PG
		08 Jan	First Internal II Semester PG
		32	Theorem.
		33	Algebraically closed fields.
		34	Algebraic closures.
		35	Theorem.
11	13-01-2020 To 17-01-2020	36	Examples and problems.
		37	Geometric Constructions.
		38	Class test.
		39	Theorem.
		40	Theorem.

No of Weeks	Dates	Session	Topic
		41	Seminar.
12	20-01-2020 To 24-01-2020	42	Finite extension field.
		43	Definitions.
		44	Examples and problems.
		45	Theorem.
		46	Theorem.
		47	Class test.
13	27-01-2020 To 31-01-2020	48	Finite extension field as finite dimensional vector spaces.
		49	Dimension of a finite field.
		50	Theorem.
		51	Theorem.
		52	Assignment.
		53	Class test.
14	03-02-2020 To 07-02-2020	54	Field extension and minimal polynomial.
		55	Seminar.
		56	Definition and constructions of fields.
		57	Class test.
		58	Simple extension field.
15	10-02-2020 To 14-02-2020	59	Galois extension.
		60	Theorem.
		61	Theorem.
		62	Examples and problems.
		63	Theorem.
16	17-02-2020 To 22-02-2020	64	Seminar.
		65	Revision.
		66	Second module internal exam.
		21 Feb	Mahasivaratri – Holiday
		67	Introduction - 3rd module.
17	24-02-2020 To 28-02-2020	24 Feb	College Day
		68	Automorphisms of finite fields.
		69	Examples.
		70	Theorem.
		71	Theorem.
		72	The Isomorphism Extension Theorem.
18	02-03-2020 To 07-03-2020	73	Examples.
		74	Isomorphism theorems.
		75	Conjugates over a field.
		76	Conjugation isomorphism theorems.

No of Weeks	Dates	Session	Topic
		77	Splitting Fields .
		78	Definitions and examples.
19	09-03-2020 To 13-03-2020	79	Constructing splitting fields.
		80	Theorem.
		81	Theorem.
		82	Separable Extensions.
		83	Finite seperable extension and simple extension.
		84	Sepperability of polynomials.
20	16-03-2020 To 20-03-2020	85	Extension of seperable elements.
		86	Galois Theory .
		87	Class test.
		88	**Revision(module 1)**
		89	**Revision(module 1&2)**
		90	**Revision-previous year university question papers.**
21	23-03-2020 To 27-03-2020		**Second Internal II Semester PG**
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
22	30-03-2020 To 03-04-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
23	06-04-2020	06 Apr	**University Exam II Semester PG Begin**

Subject Code:	**MAT2C07**
Subject Name:	**Measure and Integration**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Noble Philip**

Module –I:

Measure on the real line; Lebesgue Outer measure, Measurable sets, Ragularity, Measurable Functions, Borel and Lebesgue Measurability (Including Theorem 17), Integration of functions of a Real Variable; Integration of Non-negative Functions.
(Chapter-2; Section 2.1-2.5, Chapter-3-Section 3.1)

Module – II:

Integration of functions of a Real Variable; The general Integral, Riemann and Lebesgue Integrals Abstract Measure Space; Measures and Outer measures, extension of measure, Uniqueness of the extension.
(Chapter-3, Section 3.2 and 3.4; Chapter-5; Section 5.1 –5.3)

Module – III:

Abstract Measure Spaces; Measure Spaces, Integration with respect to a Measure Inequalities and the LP Spaces; The LP Spaces, The inequalities of Holder and Minkowski, Completeness of LP (μ) (Chapter-5, Section 5.5 –5.6; Chapter-6-section 6.1, 6.4 and 6.5)

Prescribed Textbook

G de Barra, Measure Theory and Integration. New age International Publishers, New Delhi (First Edition, 1981)

Books for Reference

1. Walter Rudin; Real and Complex Analysis; 3rd Edition, Tata McGraw Hill
2. P.R Halmos; Measure Theory; D.Van Nostrand Co.
3. A.E Taylor; General Theory of Functions and Integrations; Blaisadel Publishing Company, New York
4. Inder k Rana; An Introduction to Measure and Integration; Narosa Publishing House, New Delhi. 1997.
5. Royden H.L Real Analysis Macmillan & Co
6. N.L Carothers-Real Analysis Cambridge Press.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	04-11-2019 To 08-11-2019	1	Introduction
		2	Measure on the real line
		3	Measure on the real line
		4	Lebesgue Outer measure
		5	Lebesgue Outer measure
		6	Measurable sets
2	11-11-2019 To 15-11-2019	7	Measurable sets
		8	Ragularity
		9	Ragularity
		10	Measurable Functions
		11	Borel and Lebesgue Measurability
		12	Borel and Lebesgue Measurability
3	18-11-2019 To 23-11-2019	13	Integration of functions of a Real Variable
		19 Nov	Union Inauguration
		14	Integration of Non-negative Functions
		15	Assignment
		16	Class test
		23 Nov	Sports Day
4	25-11-2019 To 29-11-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
5	01-12-2019 To 05-12-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break

No of Weeks	Dates	Session	Topic
6	09-12-2019 To 13-12-2019	17	Introduction
		18	Integration of functions of a Real Variable
		19	The general Integral
		20	Riemann and Lebesgue Integrals
		21	Abstract Measure Space
		22	Measures and Outer measures
		12 Dec	Arts Day
		13 Dec	Arts Day
7	16-12-2019 To 20-12-2019	23	extension of measure
		24	Uniqueness of the extension
		25	Assignment
		26	Seminar
		27	Seminar
		20 Dec	Christmas Celebration
8	23-12-2019 To 28-12-2019		Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
9	30-12-2019 To 03-01-2020	28	Problems
		29	Problems
		30	Assignment
		02 Jan	Mannam Jayanthi – Holiday
		31	**Assignment**
10	06-01-2020 To 10-01-2020	06 Jan	First Internal II Semester PG
			First Internal II Semester PG
		08 Jan	First Internal II Semester PG
		32	Abstract Measure Spaces
		33	Abstract Measure Spaces
		34	Measure Spaces
		35	Measure Spaces
11	13-01-2020 To 17-01-2020	36	Problems
		37	Assignment
		38	Integration with respect to a Measure Inequalities and the LP Spaces
		39	Integration with respect to a Measure Inequalities and the

No of Weeks	Dates	Session	Topic
			LP Spaces
		40	Integration with respect to a Measure Inequalities and the LP Spaces
		41	Integration with respect to a Measure Inequalities and the LP Spaces
12	**20-01-2020 To 24-01-2020**	42	Seminar
		43	Seminar
		44	Seminar
		45	The inequalities of Holder and Minkowski
		46	The inequalities of Holder and Minkowski
		47	The inequalities of Holder and Minkowski
13	**27-01-2020 To 31-01-2020**	48	Problems
		49	Problems
		50	Assignment
		51	Completeness of LP (μ)
		52	Completeness of LP (μ)
		53	Completeness of LP (μ)
14	**03-02-2020 To 07-02-2020**	54	Completeness of LP (μ)
		55	Problems
		56	Problems
		57	Problems
		58	Problems
15	**10-02-2020 To 14-02-2020**	59	Assignment
		60	**Assignment**
		61	**Assignment**
		62	Seminar
		63	Seminar
16	**17-02-2020 To 22-02-2020**	64	Seminar
		65	Seminar
		66	Class test
		21 Feb	**Mahasivaratri – Holiday**
		67	Class test
17	**24-02-2020 To 28-02-2020**	**24 Feb**	**College Day**
		68	**Rivision**
		69	**Rivision**
		70	Rivision
		71	Class test

No of Weeks	Dates	Session	Topic
		72	Rivision
18	02-03-2020 To 07-03-2020	73	Rivision
		74	Rivision
		75	Viva
		76	Viva
		77	Class test
		78	**Rivision**
19	09-03-2020 To 13-03-2020	79	**Rivision**
		80	**Rivision**
		81	Class test
		82	Class test
		83	Viva
		84	Viva
20	16-03-2020 To 20-03-2020	85	**Viva**
		86	Rivision
		87	Rivision
		88	Rivision
		89	**Class test**
		90	**Class test**
21	23-03-2020 To 27-03-2020		**Second Internal II Semester PG**
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
22	30-03-2020 To 03-04-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
23	06-04-2020	06 Apr	**University Exam II Semester PG Begin**

Subject Code:	**MAT2C08**
Subject Name:	**Advanced Topology**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Najumunnisa K.**

Module –I:

Compactness: Compactness in metric spaces, Compact spaces. Local compactness and the relation between various forms of compactness. [Chapter 4: Sections 4.1 to 4.3 excluding Corollary 4.22]

Module – II:

The Separation and Countability Axioms: T0, T1 & T2 spaces, Regular and completely regular spaces, Normal and completely normal spaces, The countability axioms. [Chapter 5: Sections 5.1 to 5.4 excluding Examples 3, 5 and 6 and Theorem 5.10. Also exclude the proof that the Moore Plane is Completely Regular.]

Module – III:

Urysohn's Lemma and Tietze Extension Theorem, Special Topics: Urysohn's Lemma and Tietze Extension Theorem, The Alexander Subbase and Tychonoff Theorems, Urysohn's Metrization Theorem, Homotopy of Paths.
[Chapter 5: Section 5.5, Chapter 6: Section 6.7 excluding Example 20; Chapter 7: Section 7.1; Chapter 8: Section 8.1]

Prescribed Textbook

C. Wayne Patty, Foundations of Topology, Second Edition – Jones & Bartlett India Pvt. Ltd., New Delhi, 2012.

Books for Reference

1. K. D. Joshi, Introduction to General Topology, New Age International (P) Ltd., Publishers.
2. Dugundji, Topology, Prentice Hall of India.
3. G. F. Simmons, Introduction to Topology and Modern Analysis, Mc Graw Hill.
4. S. Willard, General Topology , Addison Wesley Publishing Company.
5. J. R. Munkres, Topology: A First Course, Prentice Hall of India.
6. Murdeshwar M. G., General Topology, second edition, Wiley Eastern.
7. Kelley, General Topology, van Nostrand, Eastern Economy Edition.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	04-11-2019 To 08-11-2019	1	Compactness
		2	Examples
		3	Compactness in metric spaces
		4	Seminar
		5	Theorems
		6	Theorems
2	11-11-2019 To 15-11-2019	7	Discussion
		8	Discussion
		9	Theorems
		10	Theorems
		11	Class Test
		12	Definition and Examples
3	18-11-2019 To 23-11-2019	13	Seminar
		19 Nov	Union Inauguration
		14	Seminar
		15	Seminar
		16	Seminar
		23 Nov	Sports Day
4	25-11-2019 To 29-11-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
5	01-12-2019 To 05-12-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break

No of Weeks	Dates	Session	Topic
			Semester Break
6	09-12-2019 To 13-12-2019	17	Theorems
		18	Theorems
		19	Theorems
		20	Local compactness
		21	Examples
		22	Examples
		12 Dec	**Arts Day**
		13 Dec	**Arts Day**
7	16-12-2019 To 20-12-2019	23	Relation between various forms of compactness
		24	Examples
		25	Examples
		26	Class Test
		27	Discussion
		20 Dec	**Christmas Celebration**
8	23-12-2019 To 28-12-2019		**Christmas – Holiday**
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
9	30-12-2019 To 03-01-2020	28	Seminar
		29	Seminar
		30	Seminar
		02 Jan	**Mannam Jayanthi – Holiday**
		31	Discussion
10	06-01-2020 To 10-01-2020	**06 Jan**	**First Internal II Semester PG**
			First Internal II Semester PG
		08 Jan	**First Internal II Semester PG**
		32	The Separation and Countability Axioms
		33	Examples
		34	T0, T1 & T2 spaces
		35	Examples
11	13-01-2020 To 17-01-2020	36	Theorems
		37	Examples
		38	Theorems
		39	Examples

No of Weeks	Dates	Session	Topic
		40	Regular and completely regular spaces
		41	Theorems
12	20-01-2020 To 24-01-2020	42	Examples
		43	Examples
		44	Normal and completely normal spaces, The countability
		45	Theorems
		46	Examples
		47	Theorems
13	27-01-2020 To 31-01-2020	48	Theorems
		49	Theorems
		50	Examples
		51	Examples
		52	The countability axioms
		53	Theorems
14	03-02-2020 To 07-02-2020	54	Seminar
		55	Seminar
		56	Seminar
		57	Seminar
		58	Class Test
15	10-02-2020 To 14-02-2020	59	Discussion
		60	Discussion
		61	**Introduction**
		62	Urysohn's Lemma
		63	Tietze Extension Theorem
16	17-02-2020 To 22-02-2020	64	Theorems
		65	Theorems
		66	Theorems
		21 Feb	Mahasivaratri – Holiday
		67	Examples
17	24-02-2020 To 28-02-2020	24 Feb	College Day
		68	Examples
		69	Theorems
		70	Class Test
		71	Theorems
		72	The Alexander Sub base
18	02-03-2020 To	73	Theorems
		74	Theorems
		75	Tychonoff Theorems

No of Weeks	Dates	Session	Topic
	07-03-2020	76	Examples
		77	Discussion
		78	Examples
	09-03-2020 To 13-03-2020	79	Theorems
		80	Theorems
		81	Examples
		82	Examples
		83	Urysohn's Metrization Theorem
		84	Theorems
20	16-03-2020 To 20-03-2020	85	**Class Test**
		86	Homotopy of Paths
		87	Theorems
		88	Theorems
		89	Discussion
		90	Discussion
21	23-03-2020 To 27-03-2020		**Second Internal II Semester PG**
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
22	30-03-2020 To 03-04-2020		**Study Leave**
			Study Leave
			Study Leave
			Study Leave
			Study Leave
23	06-04-2020	06 Apr	**University Exam II Semester PG Begin**

Subject Code:	**MAT2C09**
Subject Name:	**Foundations of Complex Analysis**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Riya Baby**

Module –I:

Analytical Functions, Complex Integration Power Series representation of Analytic Functions, Zeroes of an analytic function, The index of a closed curve, Cauchy's Theorem and Integral Formula, The homotopic version of Cauchy's Theorem and simple connectivity, Counting zeros the Open Mapping Theorem, Goursat's Theorem
Chapter IV Sections 2 to 8 . (2.1 to 3.6 proof omitted)

Module – II:

Singularities
Classification of singularities, Residues, The Argument Principle
The Maximum Modulus Theorem
The Maximum Principle, Schwarz's Lemma
Chapter V Sections 1 to 3 , Chapter VI Sections 1 and 2

Module – III:

Compactness and Convergence in the Space of Analytic Functions
The Spaces of continuous functions C(G, Ω), Spaces of analytic functions, The Riemann Mapping Theorem, Weierstrass Factorization Theorem.
Chapter VII Section 1 to 2; and 4 to 5

Prescribed Textbook

John B Conway- Functions of One Complex Variable, 2nd Edition, Springer International Student Edition.

Books for Reference

1. Louis Pennise: Elements of Complex Variable Half, Richart & Winston 1976
2. Silverman.H: Complex Variable, Haughton Miffin Complex, Boston 1975.
3. Rudin.W: Real and Complex Analysis (3rd Edition) McGraw Hill International Edition 1967.
4. E.T Copson: An Introduction to the Theory of a Complex Variables, Oxford University Press.
5. Lars V.Ahlfors-Complex Analysis (3rd Edition), Mc Graw-Hall international edition.

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	04-11-2019 To 08-11-2019	1	Analytical Functions
		2	Power Series representation of Analytic Functions Power Series representation of Analytic Functions
		3	Complex Integration
		4	Power Series representation of Analytic Functions
		5	Power Series representation of Analytic Functions
		6	Power Series representation of Analytic Functions
2	11-11-2019 To 15-11-2019	7	Zeroes of an analytic function
		8	Zeroes of an analytic function
		9	The index ofa closed curve
		10	The index ofa closed curve
		11	The index ofa closed curve
		12	Cauchy's Theorem and Integral Formula
3	18-11-2019 To 23-11-2019	13	Cauchy's Theorem and Integral Formula
		19 Nov	Union Inauguration
		14	The homotopic version of Cauchy'sTheorem and simple connectivity
		15	The homotopic version of Cauchy'sTheorem and simple connectivity
		16	The homotopic version of Cauchy'sTheorem and simple connectivity
		23 Nov	Sports Day
4	25-11-2019 To 29-11-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
5	01-12-2019 To 05-12-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break

No of Weeks	Dates	Session	Topic
			Semester Break
			Semester Break
			Semester Break
			Semester Break
6	09-12-2019 To 13-12-2019	17	TEST PAPER
		18	Counting zeros the Open Mapping Theorem
		19	Counting zeros the Open Mapping Theorem
		20	Counting zeros the Open Mapping Theorem
		21	Goursat'sTheorem
		22	Goursat'sTheorem
		12 Dec	**Arts Day**
		13 Dec	**Arts Day**
7	16-12-2019 To 20-12-2019	23	Cauchy's Theorem and Integral Formula
		24	Cauchy's Theorem and Integral Formula
		25	Cauchy's Theorem and Integral Formula
		26	Cauchy's Theorem and Integral Formula
		27	Cauchy's Theorem and Integral Formula
		20 Dec	**Christmas Celebration**
8	23-12-2019 To 28-12-2019		**Christmas – Holiday**
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
9	30-12-2019 To 03-01-2020	28	TEST PAPER
		29	Singularities
		30	SEMINAR
		02 Jan	**Mannam Jayanthi – Holiday**
		31	Singularities
10	06-01-2020 To 10-01-2020	**06 Jan**	**First Internal II Semester PG**
			First Internal II Semester PG
		08 Jan	**First Internal II Semester PG**
		32	Classification of singularities
		33	Classification of singularities
		34	Classification of singularities
		35	Classification of singularities
11	13-01-2020	36	Classification of singularities

No of Weeks	Dates	Session	Topic
	To 17-01-2020	37	Residues
		38	Residues
		39	Residues
		40	Residues
		41	The Argument Principle
12	20-01-2020 To 24-01-2020	42	The Argument Principle
		43	The Maximum Modulus Theorem
		44	The Maximum Modulus Theorem
		45	The Maximum Principle
		46	The Maximum Principle
		47	The Maximum Principle
13	27-01-2020 To 31-01-2020	48	TEST PAPER
		49	Schwarz's Lemma
		50	Schwarz's Lemma
		51	Schwarz's Lemma
		52	SEMINAR
		53	SEMINAR
14	03-02-2020 To 07-02-2020	54	SEMINAR
		55	Compactness and Convergence in the Space of Analytic Functions
		56	Compactness and Convergence in the Space of Analytic Functions
		57	Compactness and Convergence in the Space of Analytic Functions
		58	Compactness and Convergence in the Space of Analytic Functions
15	10-02-2020 To 14-02-2020	59	The Spaces of continuous functions C(G, Ω)
		60	The Spaces of continuous functions C(G, Ω)
		61	The Spaces of continuous functions C(G, Ω)
		62	The Spaces of continuous functions C(G, Ω)
		63	The Spaces of continuous functions C(G, Ω)
	17-02-2020	64	Spaces of analytic functions

No of Weeks	Dates	Session	Topic
16	To 22-02-2020	65	Spaces of analytic functions
		66	Spaces of analytic functions
		21 Feb	Mahasivaratri – Holiday
		67	TEST PAPER
17	24-02-2020 To 28-02-2020	24 Feb	College Day
		68	The Riemann MappingTheorem
		69	The Riemann MappingTheorem
		70	The Riemann MappingTheorem
		71	The Riemann MappingTheorem
		72	Weierstrass Factorization Theorem.
18	02-03-2020 To 07-03-2020	73	Weierstrass Factorization Theorem
		74	Weierstrass Factorization Theorem
		75	Weierstrass Factorization Theorem
		76	Weierstrass Factorization Theorem
		77	Weierstrass Factorization Theorem
		78	Weierstrass Factorization Theorem
19	09-03-2020 To 13-03-2020	79	**SEMINAR**
		80	**SEMINAR**
		81	**SEMINAR**
		82	**SEMINAR**
		83	ASSAINGMENT
		84	VIVA
20	16-03-2020 To 20-03-2020	85	**QUESTION PAPER DISCUSSION**
		86	**QUESTION PAPER DISCUSSION**
		87	**QUESTION PAPER DISCUSSION**
		88	**QUESTION PAPER DISCUSSION**
		89	**QUESTION PAPER DISCUSSION**
		90	**QUESTION PAPER DISCUSSION**
21	23-03-2020 To 27-03-2020		Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
22	30-03-2020 To 03-04-2020		Study Leave
			Study Leave
			Study Leave
			Study Leave

No of Weeks	Dates	Session	Topic
			Study Leave
23	06-04-2020	06 Apr	University Exam II Semester PG Begin

Subject Code:	**MAT2C10**
Subject Name:	**Partial Differential Equations & Integral equations**
No. of Credits:	**4**
No. of Contact Hours:	**90**
Hours per Week:	**5**
Name of the Teacher:	**Sebin Abraham**

Module –I:

First Order P.D.E.

Curves and Surfaces, Genesis of first order Partial Differential Equations, Classification of integrals, Linear equations of first order, Pfaffian differential equations, Compatible systems, Charpit's method, Jacobi's method, Integral surfaces passing through a given curve, Quasi linear equations.

[Sections 1.1 – 1.10. from the Text 1]

Module – II:

Second Order P.D.E.

Genesis of second order Partial Differential Equations.

Classification of second order Partial Differential Equations.

One dimensional Wave Equation: Vibrations of an infinite String , Vibrations of semi-infinite String, Vibrations of a String of Finite Length, Riemann's Method, Vibrations of a String of Finite Length (Method of Separation of Variables).

Laplace's Equation: Boundary Value Problems, Maximum and Minimum Principles, The Cauchy Problem, The Dirchlet Problem for the Upper Half Plane,The Neumann Problem for the Upper Half Plane.

Heat Conduction Problem: Heat Conduction - Infinite Rod Case, Heat Conduction – Finite Rod Case.

Duhamel's Principle: Wave Equation, Heat Conduction Equation.

[Sections 2.1 – 2.6. from the Text 1. Omit sections 2.4.6 to 2.4.13]

Module – III:

Integral Equations.

Introduction ,Relation Between differential and Integral Equation, The Green's Function, Frdholm Equation With Separable Kernels, Illustrative Examples, Hilbert Schmidt Theory, Iterative Methods for Solving Equations of the Second Kind.

[Sections 3.1 – 3.3, 3.6 – 3.9 from the Text 2]

Prescribed Textbook

1.AmarnathM: Partial Differential Equations, Narosa, NewDelhi(1997)
2.HildebranF.B: Methods of Applied Mathematics,(2nd Edition)Prentice- Hall of India, New Delhi(1972)

Books for Reference

1. E.A. Coddington : An Introduction to Ordinary Differential Equations Printice Hall of India ,New Delhi (1974)
2. F. John : Partial Differential Equations Narosa Pub. House New Delhi (1986)
3. Phoolan Prasad & : Partial Differential Equations RenukaRavindran Wiley Eastern Ltd New Delhi (1985)
4. R. Courant and D.Hilbert : Methods of Mathematical Physics , Vol I Wiley Eastern Reprint (1975)
5. W.E. Boyce & R.C. Deprima : Elementary Differential Equations and Boundary Value Problems John Wiley & Sons, NY, 9th Edition
6. Ian Sneddon : Elements of Partial Differential Equations McGraw-Hill International Edn., (1957)

TEACHING SCHEDULE

No of Weeks	Dates	Session	Topic
1	04-11-2019 To 08-11-2019	1	Curves and Surfaces
		2	Curves and Surfaces
		3	Curves and Surfaces
		4	Genesis of first order Partial Differential Equations
		5	Genesis of first order Partial Differential Equations
		6	Classification of integrals
2	11-11-2019 To 15-11-2019	7	Classification of integrals
		8	Classification of integrals
		9	Linear equations of first order
		10	Linear equations of first order
		11	Linear equations of first order
		12	Linear equations of first oreder
3	18-11-2019 To 23-11-2019	13	Pfaffian differential equations
		19 Nov	Union Inauguration
		14	Pfaffian differential equations
		15	Pfaffian differential equations
		16	Pfaffian differential equations
		23 Nov	Sports Day
4	25-11-2019 To 29-11-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
5	01-12-2019 To 05-12-2019		Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break
			Semester Break

No of Weeks	Dates	Session	Topic
			Semester Break
6	09-12-2019 To 13-12-2019	17	Class test
		18	Compatible systems
		19	Compatible systems
		20	Compatible systems
		21	Charpit's method
		22	Charpit's method
		12 Dec	Arts Day
		13 Dec	Arts Day
7	16-12-2019 To 20-12-2019	23	Charpit's method
		24	Jacobi's method
		25	Jacobi's method
		26	Jacobi's method
		27	Cauchy problem-Quasi linear P.D.E
		20 Dec	Christmas Celebration
8	23-12-2019 To 28-12-2019		Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
			Christmas – Holiday
9	30-12-2019 To 03-01-2020	28	Cauchy problem-Quasi linear P.D.E
		29	Cauchy problem-Quasi linear P.D.E
		30	Cauchy problem-Quasi linear P.D.E
		02 Jan	Mannam Jayanthi – Holiday
		31	Cauchy problem
10	06-01-2020 To 10-01-2020	06 Jan	First Internal II Semester PG
			First Internal II Semester PG
		08 Jan	First Internal II Semester PG
		32	Cauchy problem-Non linear P.D.E
		33	Cauchy problem-Non linear P.D.E
		34	Problem solving
		35	Class test
11	13-01-2020 To 17-01-2020	36	Second order P.D.E -Genesis of second order Partial Differential Equations.
		37	Genesis of second order Partial Differential Equations.

No of Weeks	Dates	Session	Topic
		38	Classification of second order Partial Differential Equations
		39	Classification of second order Partial Differential Equations
		40	Classification of second order Partial Differential Equations
		41	One dimensional Wave Equation: Vibrations of an infinite String
12	20-01-2020 To 24-01-2020	42	Vibrations of an infinite String
		43	Vibrations of semi-infinite String
		44	Class test
		45	Vibrations of semi-infinite String
		46	Vibrations of a String of Finite Length
		47	Riemann's Method
13	27-01-2020 To 31-01-2020	48	Riemann's Method
		49	Vibrations of a String of Finite Length (Method of Separation of Variables)
		50	Vibrations of a String of Finite Length (Method of Separation of Variables)
		51	Laplace's Equation: Boundary Value Problems
		52	Laplace's Equation: Boundary Value Problems
		53	Maximum and Minimum Principles
14	03-02-2020 To 07-02-2020	54	The Cauchy Problem
		55	The Dirchlet Problem for the Upper Half Plane,
		56	The Dirchlet Problem for the Upper Half Plane,
		57	The Neumann Problem for the Upper Half Plane.
		58	The Neumann Problem for the Upper Half Plane.
15	10-02-2020 To 14-02-2020	59	Heat Conduction Problem: Heat Conduction - Infinite Rod Case
		60	Heat Conduction Problem: Heat Conduction - Infinite Rod Case
		61	Heat Conduction – Finite Rod Case
		62	Duhamel's Principle: Wave Equation,
		63	Duhamel's Principle: Wave Equation,
	17-02-2020	64	Heat Conduction Equation.

No of Weeks	Dates	Session	Topic
16	To 22-02-2020	65	Class test
		66	Integral equation-introduction
		21 Feb	Mahasivaratri – Holiday
		67	Introduction
17	24-02-2020 To 28-02-2020	24 Feb	College Day
		68	Relation Between differential and Integral Equation
		69	Relation Between differential and Integral Equation
		70	Relation Between differential and Integral Equation
		71	The Green's Function
		72	The Green's Function
18	02-03-2020 To 07-03-2020	73	The Green's Function
		74	Frdholm Equation With Separable Kernels
		75	Frdholm Equation With Separable Kernels
		76	Frdholm Equation With Separable Kernels
		77	Illustrative Examples
		78	Illustrative Examples
19	09-03-2020 To 13-03-2020	79	Illustrative Examples
		80	Hilbert Schmidt Theory
		81	Hilbert Schmidt Theory
		82	Iterative Methods for Solving Equations of the Second Kind.
		83	Iterative Methods for Solving Equations of the Second Kind.
		84	Iterative Methods for Solving Equations of the Second Kind.
20	16-03-2020 To 20-03-2020	85	Problem solving
		86	Class test
		87	Revision and previous year question solving
		88	Revision and previous year question solving
		89	Revision and previous year question solving
		90	Test paper
21	23-03-2020 To 27-03-2020		Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
			Second Internal II Semester PG
22	30-03-2020 To		Study Leave
			Study Leave
			Study Leave

No of Weeks	Dates	Session	Topic
	03-04-2020		Study Leave
			Study Leave
23	06-04-2020	06 Apr	University Exam II Semester PG Begin